

In the Specification:

Delete the original specification in its entirety, namely pages 1-7 thereof, and insert the following substitute specification:

**CLEARER ROLLER HOLDING DEVICE FOR DRAFTING ARRANGEMENTS IN
SPINNING GROUPS**

Cross-References To Related Applications

[0001] This application claims the benefit of German patent application 10231102.1 filed July 10, 2002, herein incorporated by reference.

Background of the Invention

[0002] The invention is relative to a drafting arrangement for spinning units.

[0003] The fibrous material to be spun is customarily supplied to the spinning groups in the form of slubbings that are drafted in front of the spinning group. Drafting arrangements are used for this purpose. Waste fibers can wind around the rollers or cylinders of the drafting arrangement in an undesired manner during the operation of spinning. If this fibrous material clinging to the roller separates again from the roller and passes into the slubbing path, that is also called the track, the slubbing can receive undesired knots or thickened areas. This can result in intolerable defects in the yarn. It is known that the waste fibers can be removed from the drafting arrangement rollers by clearer rollers. The clearer rollers are entrained by the working rollers of the drafting arrangement by friction and comprise a clearer coating. The clearer coating is cleaned intermittently or continuously.

[0004] Swiss Patent Publication CH 402 690 describes a spinning machine drafting arrangement with a pivotably mounted upper roller carrier and weighting arm that receives adjustable holders for the upper rollers. Bracket-shaped cleaner-roller holders with guides inclined relative to the plane of the drafting field and for the shafts of the clearer rollers overlap the upper roller carrier and weighting arm. Clearer rollers for the upper rollers rest with their intrinsic weight on the associated upper rollers to be cleaned and remove fiber laps or the like from the upper rollers. The cleaner rollers are placed between two upper roller carrier and

weighting arms in adjacent guides of the cleaner roller holders and overlap two tracks. In the case of cleaner rollers mounted in this manner the upper rollers of the two outer tracks of a spinning machine cannot be loaded with a cleaner roller. Therefore, the first and the last spinning unit supplied by the two outer drafting arrangement tracks are frequently stopped in spinning machines. However, such a procedure has the significant disadvantage that production losses must be accepted. Also, the device according to Swiss Patent Publication CH 402 690 is not suitable for cleaning the upper rollers of the outer track.

[0005] Devices are known that permit a cleaner roller for a track to be held only on one upper roller carrier and weighting arm. With such devices the upper rollers of the first and of the last track can be cleaned and the production losses cited can be avoided.

[0006] European Patent Publication EP 0 344 944 describes a drafting arrangement in which the upper roller carrier and weighting arms comprise opposingly arranged cleaner rollers on each side, each of which overlaps only one track. The cleaner rollers have the form of a truncated cone. With this form of the cleaner roller the waste fibers separated out of the sliver should be gathered up and continuously transported to a removal station. The conical form produces a difference in the surface speed between cleaner roller and upper roller that is intended to produce a better cleaning action. The fibers gathered up by the cleaner roller are loaded up with a force component that moves the fibers to the smaller diameter of the cleaner roller. These embodiments are associated with disadvantages, depending on design. In one design the cleaner roller is connected in a non-detachable manner to the holder by rivets or, alternatively, screw connections must be loosened. In the case of pneumatically weighted upper rollers in which an elastic hose body runs in the upper roller carrier and weighting arm, axes that run through the upper roller carrier and weighting arm and to each of which two cleaner rollers are fastened, are a hindrance. Therefore, various holder constructions are fastened on an upper roller carrier and weighting arm. The manipulating of such cleaner rollers during assembly and disassembly is relatively complex compared with a simple insertion of the cleaner rollers, as is possible in the design of Swiss Patent Publication CH 402 690.

[0007] German Patent Publication DE 195 21 265 A1 shows a drafting arrangement for a spinning machine in which arrangement a cleaner roller is mounted on a pivot arm arranged laterally on the upper roller carrier and weighting arm. The construction of the holder is

relatively complex. The use of clearer rollers that are inserted between two upper roller carrier and weighting arms and overlap two tracks is not possible in the device according to German Patent Publication DE 195 21 265 A1. This is a disadvantage in as far as significantly less expense for assembly and disassembly is required in the cleaning of the clearer roller on the plurality of drafting arrangements of a spinning machine with rollers overlapping two tracks.

Summary of the Invention

[0008] The invention has the problem, starting with the previously described state of the art, of creating an improved holder for rotating clearer rollers on drafting arrangements of spinning machines.

[0009] This problem is solved with a drafting arrangement for spinning groups with at least one upper roller carrier and weighting arm held by a machine frame in which clearer rollers are rotatably mounted on an axis and can shift in a guide of a bearing element transversely to their axis of rotation in such a manner on the upper roller carrier and weighting arm that they rest on the particular associated upper roller during the spinning process. The present invention is characterized in that at least one end of the axis of a clearer roller is designed with a holding device that extends behind the guide of the bearing element, which guide is designed as a connecting link guide.

[0010] The present invention is further characterized by advantageous embodiments of the invention.

[0011] A holder is present with the design in accordance with the invention that permits a simple and rapid assembly and disassembly. The number of structural parts to be manufactured and assembled is reduced. The holder in accordance with the invention has a simple design and can be universally used for clearer rollers mounted between two upper roller carrier and weighting arms overlapping two tracks as well as for clearer rollers for one track.

[0012] A holding device designed as a collar can be manufactured in a particularly simple and economical manner.

[0013] A connecting link guide comprising a spring element on each side of the bearing element, with which spring the axis of the clearer roller can be loaded with a force that presses the clearer roller against the upper roller, assures that the clearer roller always has contact with the upper roller and thus results in a better clearing action. At the same time the play between the connecting link guide in the axis of the clearer roller is eliminated and a stabilization of the direction of the clearer roller achieved.

[0014] An electrostatic charging of the clearer roller is avoided with an electrically conductive connection between clearer roller and machine frame. Such an electrostatic charge can result in functional disturbances and yarn defects.

[0015] The invention will be explained in detail using the exemplary embodiments shown in the figures.

Brief Description of the Drawings

[0016] Figure 1 shows a simplified perspective partial view of upper roller carrier and weighting arms of a drafting arrangement.

[0017] Figure 2 shows a bearing of a clearer roller for a track and of a clearer roller for two tracks in a bearing element in a perspective view.

[0018] Figure 3 shows a bearing of two clearer rollers for one track on a bearing element in a perspective view.

[0019] Figure 4 shows a simplified perspective partial view of upper roller carrier and weighting arms of a drafting arrangement with two clearer rollers for one track.

Detailed Description of the Preferred Embodiments

[0020] Figure 1 shows by way of example a part of a drafting arrangement with two clearer rollers 1 inserted between two upper roller carrier and weighting arms 2, 3 and resting on two upper rollers of the front drafting roller pairs, as well as shows two other clearer rollers 4, 5 resting laterally to outer upper roller carrier and weighting arms 2 on the upper rollers of the outer front drafting roller pairs. Clearer rollers 1 cooperate with the upper rollers of two tracks whereas clearer rollers 4, 5 cooperate only with the upper rollers of one track during the

spinning operation. All drafting roller pairs and their bearings are not shown for reasons of simplification. Upper roller carrier and weighting arms 2, 3 comprise bearing elements 6 in which clearer rollers 1, 4, 5 are laterally mounted. The bearing elements for other clearer rollers as well as the clearer rollers cooperating with the rear upper rollers are not shown for the sake of better clarity. Upper roller carrier and weighting arms 2 can be pivoted in a customary manner out of the lowered position, the operating position, shown into an upper final position. Details of the bearing of clearer rollers 1, 5 can be gathered from Figure 2. Upper roller carrier and weighting arm 2 and the fastening elements with which bearing element 6 is fastened to upper roller carrier and weighting arm 2 are not shown in order to be able to show the bearing clearly.

[0021] Bearing element 6 is symmetrically designed and comprises a guide element 7, 13 on each side that forms a connecting link guide. Each guide element 7, 13 comprises a spring element 8, 14. One end of the axis of clearer roller 5 designed as hollow bearing pin 9 is inserted to the outer side of upper roller carrier and weighting arm 2 (on the left in the view of Figure 2). Clearer roller 5 is drawn away from hollow bearing pin 9 in order to assure an unimpeded view of the bearing. In the thrust-on position of clearer roller 5 onto hollow bearing pin 9 a detachable fixing of clearer roller 5 on hollow bearing pin 9 takes place by means of engagement nipple 11. Engagement nipple 11 cooperates with an engagement groove (not shown here) as is described in detail, e.g., in German Patent Publication DE 195 21 265 A1. Clearer roller 5 is provided with clearer coating 10. Hollow bearing pin 9 comprises collar 12 on its end inserted into bearing element 6. This collar 12 engages behind the connecting link guide formed by guide element 7 and brings it about that clearer roller 5 is held with one-sided bearing during the operation of the drafting arrangement by bearing element 6. Spring element 8 is curved in such a manner that hollow bearing pin 9 is loaded with a force that presses clearer roller 5 in addition to the force produced by the intrinsic weight of clearer roller 5 against the associated upper roller. During the removal of clearer roller 5 upward out of bearing element 6 spring element 8 is pressed to the side by hollow bearing pin 9 and consequently frees clearer roller 5. Even during the insertion of clearer roller 5 the resistance produced by spring element 8 can be readily overcome. This makes possible a simple, easy and rapid assembly and disassembly of clearer roller 5. Clearer roller 4 is designed and held in the same manner as clearer roller 5. Guide element 13 with spring element 14 is designed with mirror symmetry relative to guide

element 7. Hollow bearing pin 15 of clearer roller 1 is inserted into guide element 13. On the opposite end of clearer roller 1 it is inserted with a hollow bearing pin in a bearing element 6 (not shown in Figure 2) of upper roller carrier and weighting arm 3, as Figure 1 shows. Clearer roller 1 rests like clearer roller 5 by virtue of its intrinsic weight. While clearer roller 5 cooperates as an individual roller with only one upper roller, clearer roller 1 clears two upper rollers with its clearer coating 16. The contact force on the upper roller exerted by the intrinsic weight is strengthened by the force component applied by spring element 14 on hollow bearing pin 15. A corresponding force component is applied by the spring element (not visible in Figure 2) of bearing element 6 fastened on upper roller carrier and weighting arm 3.

[0022] In the bearing shown in Figure 3 hollow bearing pin 15 of clearer roller 1 is replaced relative to Figure 2 by hollow bearing pin 17. As can be gathered from Figure 4, instead of clearer roller 1 a clearer roller 18 like clearer roller 5 mounted only on one side is inserted into guide element 13. A collar 19 is formed on the end of hollow bearing pin 17 of clearer roller 18, like on the end of hollow bearing pin 9. Collar 19 extends behind the connecting link guide comprising guide element 13 and brings about, like hollow bearing pin 9 of clearer roller 5, a reliable holding with one-sided bearing of clearer roller 18. For the sake of better clarity of the bearing, clearer rollers 5, 18 are not shown in Figure 3.

[0023] Clearer rollers 1 mounted on both sides in the arrangement of Figure 1 are replaced in the arrangement of Figure 4 by two clearer rollers 18 mounted on one side. It is not necessary for assembly and disassembly, that can take place in a simple, easy and rapid manner, to replace or modify bearing element 6 or guide elements 7, 14. Thus, bearing elements 6 can be universally used. In the arrangement of Figure 4 the upper roller carrier and weighting arms 2, are raised or lowered independently of one another without clearer rollers having to be removed from the bearing.

[0024] The invention is not limited to the exemplary embodiments described. In another alternative embodiment clearer rollers 1 extending over two tracks can comprise instead of the embodiment with hollow bearing pins 15 embodiments with hollow bearing pins 9, 17 with collar 12, 19. This allows the number of different parts to be further reduced. The bearing elements for the cleaner rollers of the rear upper rollers retain the U-shaped constructional form

that is substantially present and can be adjusted, e.g., in a customary manner by means of oblong holes in the longitudinal direction of the upper roller carrier and weighting arm 2, 3.

[0025] It will therefore be readily understood by those persons skilled in the art that the present invention is susceptible of broad utility and application. Many embodiments and adaptations of the present invention other than those herein described, as well as many variations, modifications and equivalent arrangements, will be apparent from or reasonably suggested by the present invention and the foregoing description thereof, without departing from the substance or scope of the present invention. Accordingly, while the present invention has been described herein in detail in relation to its preferred embodiment, it is to be understood that this disclosure is only illustrative and exemplary of the present invention and is made merely for purposes of providing a full and enabling disclosure of the invention. The foregoing disclosure is not intended or to be construed to limit the present invention or otherwise to exclude any such other embodiments, adaptations, variations, modifications and equivalent arrangements, the present invention being limited only by the claims appended hereto and the equivalents thereof.